Darcy L. Endo-Omoto
Vice President
Government & Community Affairs

March 19, 2009

FILED
2009 MAR 19 P 4:08
PUBLIC UTILITIES
COMMISSION

The Honorable Chairman and Members of the
Hawaii Public Utilities Commission
Kekuanaoa Building, First Floor
465 South King Street
Honolulu, Hawaii 96813

Dear Commissioners:

Subject: *Docket No. 2008-0273*
HECO Companies' Responses to the Commission's Information Requests

The Commission submitted Information Requests ("IRs") prepared by the Commission's consultant, the National Regulatory Research Institute, by letter dated March 2, 2009 in the subject proceeding. The Hawaiian Electric Companies filed responses to PUC IRs 1 to 3, 5 to 31, and 33 to 35 on March 18, 2009.[1] Enclosed are the Companies' responses to the remaining IRs, PUC-IR-4 and PUC-IR-32. Also enclosed are the Companies' revised responses to PUC-IR-14 and PUC-IR-21. Please replace the previously submitted responses to PUC-IR-14 and PUC-IR-21 with the enclosed revised responses. The Companies apologize for any inconvenience this may have caused.

Sincerely,

Enclosures

cc: Service List

[1] The "Hawaiian Electric Companies" or "Companies" are Hawaiian Electric Company, Inc., Hawaii Electric Light Company, Inc., and Maui Electric Company, Limited.

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PUC-IR-4

Based on HECO's interconnection studies and system planning, please list the size, technology, location, and expected completion date of all I MW or larger renewable energy projects in advanced development or under construction in Hawaii.

Response:

The completion date for a project generally depends on the sequential completion of (1) detailed design of the project by the developer, (2) an Interconnection Requirements Study (IRS) by the utility or its contractor, (3) execution of a PPA incorporating the results of the IRS, (4) approval of the PPA by the Commission after review of the PPA by the Consumer Advocate and Commission, (5) acquisition of permits, land use approvals and financing by the developer, and (6) ordering of equipment and construction of the project by the developer. In many instances, activities are conducted in parallel. In some cases, as discussed in various proceedings, additional activities are necessary, such as the conduction of a grid integration study for additional wind on Maui, or Implementation Studies for the Big Wind projects on Lana'i and Moloka'i, or a Performance Requirements Study.

Large projects that are under "advanced development", depending on the definition of that term, would include (1) the three "grandfathered" projects on Oahu, for which executed term sheets have been filed in Docket No. 03-0372 on September 2, 2008, and for which PPAs are being finalized and for which IRS Letter Agreements (and, in one instance, a Performance Requirements Study letter agreement) have been executed, (2) the two grandfathered wind projects on Maui that have been the subject of a structured negotiations process as described in Docket No. 2008-0021, (3) the short-listed "conforming" bids under the Oahu Renewable

Energy RFP, Docket No. 2007-0331, for which IRS's are being initiated, (4) the two "Big Wind" projects submitted as non-conforming bids, which are the subject of the Implementation Studies already under way pursuant to the Energy Agreement, as described in letter dated and filed March 16, 2009, in Docket No. 2007-0331, (5) the exempt geothermal expansion by PGV on the Big Island, as described in Docket No. 2008-0063, (6) the biomass project for which a term sheet was completed under a competitive bidding waiver on the Big Island, as described in Docket No. 2008-0143., (7) the Lanai Sustainability Research photovoltaic (PV) project on Lanai (at 1.2 MW is "large" by Lana'i standards), which was approved in Docket No. 2008-0167, and is currently operating at less than its nameplate rating because the battery energy storage system needed to address intermittency issues inherent in a PV facility has not been installed, and (8) a biomass-fired cogeneration project on the Big Island, for which a PPA was executed (subject to amendment based on the now completed IRS), but which is still obtaining financing for the project.

The Hawaiian Electric Utilities are also working with the developers of a number of smaller projects that are exempt from competitive bidding by virtue of size, but which would exceed 1.0 MW, including a potential wave energy demonstration project on Maui and several potential PV projects. In addition, HELCO was unable to complete PPAs for two Big Island projects, including (a) a Wind/BESS project and (b) a Wind/Pumped Hydro project, within the time allowed under the Commission's competitive bidding waiver orders in Docket No. 2008-0061, but has committed to initiate an RFP process that could allow one or both projects to proceed.

Information regarding the proposals generally is deemed to be confidential by the developers, except to the extent made public in permitting processes or for other reasons, until an application for approval of a PPA is filed with the Commission.

PUC-IR-14

Please describe all ways in which small-scale, biomass generators, including anaerobic digestion systems, do not meet the criteria listed on page 5 of the HECO and the Consumer Advocate's FiT proposal.

Response:

There are no small-scale (e.g., sub-1 MW) biomass generators currently operating on the HECO, HELCO, or MECO grid systems. At this time, MECO is aware of a potential small-scale biomass generator on Maui.

Biomass generators can differ in the resource/feedstock used (e.g., sewage sludge, animal waste, agricultural waste, municipal solid waste, etc.), the level of resource/feedstock processing required for conversion, the conversion technology utilized (e.g., anaerobic digestion, gasification, combustion, etc.), and the type of power generating equipment employed (e.g., internal combustion engine, combustion turbine, steam turbine, etc.). These differences can result in varying costs of generation, and as a result, the establishment of standardized energy payment rates and contractual terms to address these issues in a feed-in tariff would be difficult at best to determine.

PUC-IR-21

Are there any installed wind turbines in Hawaii with less than 150 kW of capacity? If so, please describe their sizes in kWs, locations, total number, aggregate capacity, and installation years.

Response:

Wind turbines with rated capacity less than 150 kW are installed in the service territories of HECO, HELCO, and MECO. The wind turbines that are known to HECO, HELCO, and MECO to be in service are listed below.

Island of Oahu (HECO)

- One wind turbine has been installed under net energy metering (installation year in parenthesis): one 0.4-kW (2007) in Honolulu.

Big Island of Hawaii (HELCO)

- In 1985, thirty-nine 17.5-kW and eighty-one 20-kW wind turbines (120 wind turbines in total) with an aggregate capacity of approximately 2,300 kW were installed at the Lalamilo wind farm. The output of the wind farm has declined over the years due to the age of the machines. Other options are being researched to restore capacity at the Lalamilo site.

- Five 10-kW wind turbines with an aggregate capacity of 50 kW were installed at Parker Ranch in Waimea in 2000.

- Seventeen wind turbines with an aggregate capacity of 49.2 kW have been installed under net energy metering (installation year in parenthesis): one 1.8-kW (2008) and one 10-kW (2008) in Kamuela; one 1-kW (2006), two 1.8-kW (2008), one 1.9-kW (2008), and one 4.8-kW

(2009) in Kapa'au; one 1-kW (2006), six 1.8-kW (2008), one 1.9-kW (2008), one 2.4-kW (2009), and one 10-kW (2005) in Hawi.

Island of Maui (MECO)

- Six 1-kW wind turbines with an aggregate capacity of 6 kW were installed at the Maui Ocean Center in Maalaea in 2008.

- Two wind turbines with an aggregate capacity of 3.6 kW have been installed under net energy metering (installation year in parenthesis): one 1.8-kW (2008) and one 1.8-kW (2009) in Haiku.

PUC-IR-32

Should the FiT price determination for each technology factor in an estimated annual amount of curtailment as described in HECO and the Consumer Advocate's responses to HDA/HECO-IR-1 and HDA/HECO-IR-4? If so, how should the amount of curtailment be estimated?

Response:

The inclusion of possible curtailment impacts on energy production in the FiT pricing warrants consideration. As noted in the response to HDA/HECO-IR-1, the HECO utilities anticipate that the FIT price rate for certain resources may include a slight upward adjustment to account for the possibility of reduced energy sales under tariffs that allow for curtailment (See section 3.5.2 of KEMA report, page 25, attached to the December 23, 2008 filing). However, as described in HDA/HECO-IR-1, estimating curtailments would be a complex problem and could not be done accurately. The estimate would require extensive modeling. It would involve several uncertainties, including estimations of the anticipated energy production, future system demand, future generation additions which might contribute to curtailments, and other system conditions. In addition, the consideration of possible curtailments in pricing would result in an unintended consequence of encouraging resources to come online with anticipated hours of non-production (which are compensated), because the output of the resource is not correlated with the system demand. The price paid would not reflect the true value of the energy to the system and consumers. Compensation for curtailment takes away the natural disincentive for adding excessive amounts of must-take energy to a system that will occur if the producer bears the costs of curtailment (through reduced sales). If curtailments are anticipated to be significant, then it is a clear indication that there is an excess amount of that type of energy on the power system or it is producing at the wrong time of day. The issues of excessive must-take energy extend beyond

increased costs for the ratepayer; another result is a less responsive power system which is more at risk to failure following disturbance, as it is constrained towards minimum dispatch on the responsive generation which reduces the ability of the system to respond to loss of load events.

Therefore, it is recommended that any compensation to suppliers for potential curtailments be limited for these reasons. The need for curtailment for excess energy can be mitigated in a larger sense through targeting appropriate generation additions and limiting certain types of energy to avoid contributing must-take production during excess energy periods.

In addition, if the FiT concept is properly limited to smaller projects that do not present integration issues, then the issue of curtailment during excess energy periods can be minimized.

Perhaps oversimplifying the issue, as-available energy IPPs can be curtailed (or their output can be interrupted) due to:

1. System Problems
    a. Caused by specific as-available energy Facilities - failing to comply with power quality (or performance) standards
    b. Caused by intermittent energy in general - excessive frequency fluctuations

2. Grid Constraints
    a. E.g., the line through which the IPP is interconnected to the grid is de-energized for service
    b. E.g., the line through which the IPP is interconnected to the grid incurs a forced outage

3. Excess Energy Situations

In the case of (3) and perhaps 1(b), curtailment generally is implemented, by contract, in reverse chronological order. In order to do this, there has to be a mechanism to institute and remove

curtailment. In recent and new PPAs, that mechanism is a curtailment control interface. (With older PPAs, it may be done through telephone call.) The PPA provisions to do this are far more extensive than those in the proposed feed-in tariff contract, which generally relies on disconnection. Thus, as noted in the response to HRD/HECO-IR-4, there are small, essentially "non-curtailable" resources, such as residential PV systems, for which installation of curtailment equipment may not be technically or economically feasible.

If the feed-in tariff projects are small, and the amount is limited each year, an argument might be made that the projects generally should not be subject to curtailment during excess energy situations (unless absolutely necessary). The Commission would have to agree that such small generation projects (such as Feed-in Tariff projects, etc.) that are allowed to be installed without curtailment controls would not be curtailed before other as-available energy IPPs (including existing IPPs) because it is not practical. However, the impact on existing IPP's, and on projects currently under development in a difficult financing environment, of such a policy would have to be considered.

A third method to address the issue is to address the payment rate prospectively to take into account the level of curtailment experienced in the past, to the extent that the experienced curtailment exceeds some expected threshold. This "makewhole" method would be difficult to administer in practice, and would not address the issues of encouraging the "wrong" projects discussed above. In addition, curtailed energy can only be estimated, it cannot be "measured". For example, the calculation of estimated curtailed energy for a wind farm is complicated, and requires extensive, time-sensitive data.